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Awareness and knowledge of medical ethics in undergraduate medical students at Umm Al-Qura University: A cross-sectional study

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ABSTRACT

Background: Medical ethics is a field that involved in human lives therefore it needs more attention. In the medical ethics education, undergraduate medical students have been reported to have distinct weakness in ethical awareness and knowledge. The aim is to evaluate the general knowledge, and perceptions of medical ethics among undergraduate medical students at Umm Al-Qura University (UQU), Mecca, Saudi Arabia. **Method:** A quantitative cross-sectional survey was conducted at Umm Al-Qura University, College of Medicine, Mecca from September to October 2021. A total of 468 undergraduate medical students, ranging from 19 to 25 years have been involved in the research. An online structured questionnaire included questions about knowledge of medical ethics and consent. **Results:** The study results showed that undergraduate medical students' knowledge regarding medical ethics 35.5% of students demonstrated a good level of knowledge regarding medical ethics and consent. In comparison, 64.5% had a poor knowledge level. A statistically significant association showed that a good level of knowledge was detected among 38.6% of students in their clinical years compared to 30.9% of those in their pre-clinical academic years ($P = 0.048$). In addition, 39.2% of male students had a good knowledge level, compared to 32.3% of females ($P = 0.120$). About 76.7% of the participants acknowledged the importance of medical ethics. **Conclusion:** Medical students at UQU generally appreciate the significance of knowledge about medical ethics, and the majority showed significant variability to individual questions. In general, about a third of the participants had a great understanding of medical ethics and consent.

Keywords: Medical ethics, medical students, knowledge, awareness, attitude, consent.

1. INTRODUCTION

Due to certain unethical practices during world Wars I and II, The World Medical Association (WMA) signed the Declaration of Helsinki, which sets out the boundaries for ethical issues in medical research (Cook et al., 2011). Despite this declaration, there were still numerous examples of unethical research and clinical practices, such as the Tuskegee syphilis study, thalidomide tragedy, and radiation experiments during the Cold War in the US (White Junod, 2008; Kim & Scialli, 2011; Paul & Brookes, 2015). Medical ethics requires careful attention since it is about respecting human lives. In clinical practice, the issues concerning medical ethics are often due to complaints about healthcare staff's poor adherence to ethical procedures. Moreover, a growing number of litigations against healthcare practitioners have been observed (Aarons, 2006).

Medical ethics are a set of concepts and values that serve as a guide for individuals who work in the medical field regarding their behaviour towards others. These principles consist of Autonomy means that the patient has the right to make decisions about their health care unless the patient is considered incompetent. Beneficence is defined to benefit the patient and society, non-maleficence is to guarantee that neither the patient nor community will be harmed, Justice refers to the equitable distribution of benefits and burdens of care among those who require it (Charles & Lazarus, 2000; Reinhardt & Salvador, 2018; Shrestha et al., 2021; Gillon, 2015; Gambert, 2007). These principles are necessary to ensure a safe medical practice to protect patient rights.

Medical practitioners need to keep these values in mind when considering patients' families in the treatment decision-making process, which also has consequences for the patient (Park & Jeon, 2019; Steiner-Hofbauer et al., 2018; Unnikrishnan et al., 2014; Iyalomhe, 2009). Medical ethics has been recognized as an important part of the curriculum for college's students at the faculty of medicine in Umm Al-Qura University. However, the medical ethics education implemented in this university has been reported to have resulted in specific weaknesses in medical ethics awareness and knowledge in the medical students (Gjerberg et al., 2010; Dhali et al., 2010; Mak-Van Der Vossen et al., 2017; Mohamed et al., 2012; Brogen et al., 2009; Tiruneh & Ayele, 2018). The aim of this study is to evaluate the level of knowledge and awareness among Umm Al-Qura University medical students in Saudi Arabia to address this issue.

2. METHODOLOGY

A quantitative cross-sectional study was conducted at the College of Medicine, Umm Al-Qura University, Mecca, Saudi Arabia, from September to October 2021. All participants were Saudi undergraduate medical students selected via a cluster sampling technique; the participants were indifferent academic years, either pre-clinical or clinical. Participation was voluntary, and informed consent was taken from the study participants; after explaining the study objectives and that their information will be kept anonymized and utilized for research aims only. The participants had the option to withdraw from the study at any time. The data was collected using a structured online questionnaire that has been formulated and adopted from relevant literature (Nepal, 2017) and carefully evaluated by researchers after expert's consultations. A number of three experts at UQU reviewed the study questionnaire independently, and all the recommended changes were performed.

The survey was administered to the students by representatives of each academic year through social media platforms (WhatsApp), and it was sent individually to each participant to ensure privacy. The questionnaire is divided into two sections. The first part involves questions about participant's demographic characteristics including age (ranged from 19 to 25 years), gender, and academic year either clinical or pre-clinical, besides the students' perception toward the importance of ethics. The second part is meant to cover student knowledge regarding medical ethics and the subject of consent. Ethical approval provided from Umm Al-Qura ethical committee.

Data Analysis

The data was collected, organized, and saved into an excel sheet, then converted and coded using a statistical package for social sciences (SPSS, Inc. Chicago, IL). Descriptive statistics were performed for categorical variables and represented as frequencies and percentages. Continuous variables were shown as means and standard deviation. Statistical analysis was performed using a two-tailed test. A p-value below 0.05 was determined statistically significant. Each answer in the questionnaire was given as a single point, then the discrete scores of the various items were summed together to achieve a total score. A student with a score of 60% or higher was perceived to have good awareness. Based on a descriptive analysis frequency and percent distribution was performed for all variables. Cross-tabulation analysis was applied in order to evaluate the variation of knowledge levels according to student personal data and perceptions. These data were analysed using a Pearson chi-squared test and an exact probability test for small frequency distributions. T-test was performed to test for association between continuous variables.

3. RESULTS

In total 468 participants completed the study questionnaire. Participants ranged from 19 to 25 years, with a mean age of 21.5 ± 1.5 years old. Approximately half of the students, 251 (53.6%), were females. A total of 280 (59.8%) students were in their clinical years (Table 1).

Table 1 Personal data of study undergraduate medical student participants at Umm Al-Qura University, Saudi Arabia

Personal data	No	%
Age in years		
19-20	145	31.0%
21-22	201	42.9%
23-25	122	26.1%
Gender		
Male	217	46.4%
Female	251	53.6%
Academic year		
Pre-clinical years	188	40.2%
Clinical years	280	59.8%

For the results, regarding the participants views on the importance of ethical dilemmas in the medical field. (76.7%) think that it is essential while 17.7% reported that it is crucial. In addition, almost two-thirds of the student participants, 59.8%, learn about ethics from university lectures, 25% from clinical training, and 8.8% from the media. Moreover, 53.6% of the students know that the university has an ethics committee. Table 2 below illustrates the data in more detail.

Table 2 Source of knowledge and information about medical ethics

How important are ethical issues in the medical profession?		
Extremely important	359	76.7%
Important	83	17.7%
Somewhat important	12	2.6%
Not important at all	14	3.0%
Where have you learnt the most?		
Lectures	280	59.8%
Clinical training	117	25.0%
Ethical books	25	5.3%
Media	41	8.8%
Others	5	1.1%
Does your institute have an ethics committee?		
Yes	251	53.6%

No	22	4.7%
Don't know	195	41.7%

Table 3 shows participants' knowledge of medical ethics. The results illustrate that 75.2% believe that intimate rectal and vaginal examinations cannot be performed without informed consent; 62.6% reported that they did not believe that ethical conduct is essential only to avoid legal action. 61.5% claimed that close relatives should always be informed about a patient's condition, and 29.9% reported that the doctor should do whatever is best irrespective of the patient's opinion. 58.3% claimed it was not ethical for a male doctor to examine a female patient when no female relative or nurse was present. 42.3% objected that writing "within normal limit" during system examination without examination is acceptable for documentation, and 31.2% reported that if a terminally ill patient wishes to die, they should be assisted to do so ethically. Furthermore, according to 83.5% of the participants the patient should always be informed if something goes wrong.

Table 3 Undergraduate medical students' knowledge regarding medical ethics, Umm Al-Qura University, Saudi Arabia

Medical ethics items	Disagree		Agree		Don't know	
	No	%	No	%	No	%
Ethical conduct is important only to avoid legal action.	293	62.6%	104	22.2%	71	15.2%
Patient's wishes must be always adhered during treatment.	93	19.9%	307	65.6%	68	14.5%
The doctor should do whatever is best irrespective of patient opinion.	279	59.6%	140	29.9%	49	10.5%
The patient should always be told if something goes wrong.	38	8.1%	391	83.5%	39	8.3%
Close relative must always be told about the patient condition.	288	61.5%	136	29.1%	44	9.4%
Children should never be treated without the consent of parents/guarding.	130	27.8%	272	58.1%	66	14.1%
Patient who refuses treatment on religious/social ground should be instructed to find another doctor.	156	33.3%	146	31.2%	166	35.5%
Is it ethical if a male doctor examines a female patient in his chamber when no female relative or female nurse is there	273	58.3%	123	26.3%	72	15.4%
Intimate rectal/vaginal examination can be performed by students and residents without informed consent.	352	75.2%	56	12.0%	60	12.8%
If a terminally ill patient wishes to die, he/she should be assisted to do so ethically.	189	40.4%	146	31.2%	133	28.4%
Patient has a right to refuse life supporting treatment.	111	23.7%	260	55.6%	97	20.7%
During system examination writing "within normal limit" without examination is acceptable for documentation	198	42.3%	72	15.4%	198	42.3%

Given participant knowledge regarding medical ethics consent, 89.1% of the students reported that consent should be obtained for major surgeries, whereas 67.5% reported consent approval for minor operations. For genital examination of females, 67.5% felt consent was necessary, while 66% said that consent was required for genital examinations with male patients. This figure lowered for general physical examinations at 62.4%, believing consent is necessary, which further reduced for routine investigations to 40.4%. In emergency cases, 71.2% reported that children could be treated without parental or guardian consent. However, 69.7% believe that adults can be managed despite their consent or approval. Only 36.3% said that a patient's wishes must adhere. Additionally, 26.3% expressed that doctor can refuse treatment if a patient cannot pay the fees, and 21.8% think that doctors can refuse to treat a violent patient or a patient with violent relatives (table 4).

Table 4 Undergraduate medical students' knowledge regarding medical ethics consent, Umm Al-Qura University, Saudi Arabia

Knowledge regarding consent	No	%
Consent should be taken for		
<i>All major operations</i>	417	89.1%
<i>All minor operations</i>	316	67.5%
<i>Routine investigations</i>	189	40.4%
<i>Treatment with adverse reactions</i>	344	73.5%
<i>General physical examinations</i>	292	62.4%
<i>Genital examinations (male)</i>	309	66.0%
<i>Genital examinations (female)</i>	316	67.5%
In emergency		
<i>Children can be treated without parental or guardian consent.</i>	333	71.2%
<i>Adults can be treated without their consent.</i>	326	69.7%
<i>Patient wishes must be adhered to.</i>	170	36.3%
<i>Doctors can refuse treatment if a patient is unable to pay the fees.</i>	123	26.3%
<i>Doctors can refuse to treat a violent patient or a patient with violent relatives.</i>	102	21.8%

Figure 1 below illustrates the overall undergraduate medical student knowledge regarding medical ethics, it shows that 166 (35.5%) students demonstrated a fair level of understanding regarding medical ethics and consent while 302 (64.5%) had poor knowledge level.

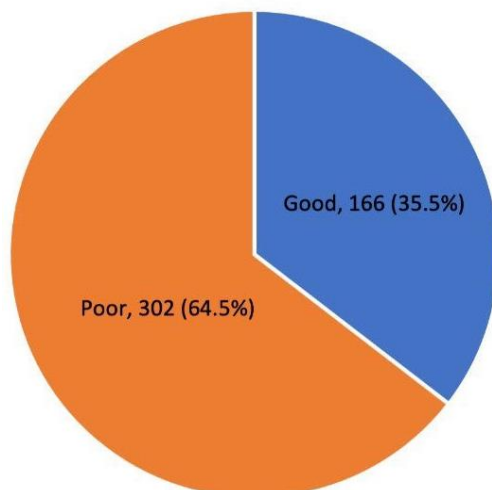
**Figure 1** Overall undergraduate medical students' knowledge regarding medical ethics, Umm Al-Qura University, Saudi Arabia

Table 5 below presents the distribution of medical students' knowledge regarding medical ethics according to their personal data. The findings revealed an excellent degree of knowledge. among 41% of participants aged 23 to 25 years, compared to 29% of those aged 19 to 20 years, with no statistical significance (p-value = 0.108). Also, 39.2% of male students had a good knowledge level, compared to 32.3% of females (p-value = 0.120). Furthermore, a fair level of understanding was detected among 38.6% of students in their clinical years in comparison to 30.9% of those in their pre-clinical academic years, with a recorded statistical significance (p-value = 0.048). Moreover, 39.3% of the students view ethics as extremely important, thus demonstrating a good knowledge level compared to those that felt it was unimportant (p-value = 0.002). Besides, 45.8% of students who knew there was an ethics committee at their university also demonstrated a knowledge level of medical ethics compared to 13.6% who did not realise that there was a committee (p-value = 0.001).

Table 5 Distribution of medical student's knowledge regarding medical ethics by their personal data

Personal data	Knowledge level				p-value
	Poor		Good		
	No	%	No	%	
Age in years					.108
19-20	103	71.0%	42	29.0%	
21-22	127	63.2%	74	36.8%	
23-25	72	59.0%	50	41.0%	
Gender					.120
Male	132	60.8%	85	39.2%	
Female	170	67.7%	81	32.3%	
Academic year					.048*
Pre-clinical years	130	69.1%	58	30.9%	
Clinical years	172	61.4%	108	38.6%	
How important are ethical issues in medical profession?					.002*\$
Extremely important	218	60.7%	141	39.3%	
Important	59	71.1%	24	28.9%	
Somewhat important	11	91.7%	1	8.3%	
Not important at all	14	100.0%	0	0.0%	
From where do you learn the most?					.099\$
Lecture classes	167	59.6%	113	40.4%	
Clinical training	85	72.6%	32	27.4%	
Ethical book	17	68.0%	8	32.0%	
Media	30	73.2%	11	26.8%	
Others	3	60.0%	2	40.0%	
Your institute have ethics committee					.001*
Yes	136	54.2%	115	45.8%	
No	19	86.4%	3	13.6%	
Don't know	147	75.4%	48	24.6%	

P: Pearson X² test

§: Exact probability test

*P < 0.05 (significant)

4. DISCUSSION

Though the significance of medical ethics has long been recognized, it has recently become a priority in educational, medical institutions over the last three decades (Al-Haqwi & Al-Shehri, 2010). It is possible that this is related to increasing public pressure

enhancements in diagnostic and therapeutic measures. This was a further likelihood of medical errors and a higher public awareness of medical mistakes (Gray, 2013; Yacoub & Ajeel, 2000; Aljarallah & Alrowaiss, 2013). It has been shown that some undergraduate medical students have some blind spots in their ability to deal with ethical issues (Arun Babu et al., 2013), and so they require further support from their teachers. This research was carried out in order to assess undergraduate medical students' knowledge of medical ethics and how that relates to their participant demographic data.

The findings revealed that nearly one-third of the students (35.5%) had a good medical ethics and consent knowledge level. Approximately three-quarters of the participants agreed that the patient should always be informed if something goes wrong; two-thirds agreed that patient wishes must always be adhered to during treatment. About half reported that children should never be treated without a parent's or guardian's permission. The vast majority of those who participated agreed that it was necessary for significant operations, three-quarters for adverse reactions, two-thirds for minor operations, and two-thirds for female and male genital examinations before undertaking any form of procedure. During an emergency, about three-quarters of the students reported that children can be managed despite the consent of their parents or guardians. More than two-thirds stated that adults could not be treated without their consent.

In summary of the data, students in their clinical years have a much better level of knowledge. This could be related to the fact that they had already had several clinical sessions at this stage, with extensive clinical practice, thus exposing them to varying situations, which enabled them to explore ethics in further depth. Moreover, they may study the medical issue in their classrooms, as reported by about half of the student participants. The results also showed that students who think that medical ethics are important showed a higher knowledge level, while none of those viewed as unimportant were knowledgeable. This might be due to a lack of interest or that they did not realize the significance of the problem. More importantly, the problem may be because the education curriculum may lack medical ethics courses. Students with knowledge of the ethics committee in the university showed higher knowledge levels as they may have participated in research projects that raised their awareness of medical ethics for conducting their research projects. It has been estimated that 50.9% of medical students have good knowledge of medical ethics, whereas 37.2% had a fair score (Chatterjee & Sarkar, 2012).

Students with more advanced years in medical education also had higher knowledge scores. It was found that 37.8% of medical students know that physicians must follow medical ethics, and 57.9% said that it is crucial (Kumar Jatana et al., 2018). Most of the students learned medical ethics from clinical discussions, lectures, and seminars during their clinical years, while 45.4% obtained information from online sources: 39.3% from the media and 23.8% from medical journals. It has also been reported that the Hippocratic Oath was known to 98.8% of the students, while 60.9% were familiar with the Nepal Medical Council code of ethics (Aacharya & Shakya, 2016). Approximately 91.3% of the students think that medical ethics is essential in a medical career. It has further been concluded that medical students have inadequate levels of legal knowledge, especially as it related to their future careers (Walrond et al., 2006).

With advancements in healthcare for medical research, practitioners must be familiar with the fundamental ethical norms established to secure the well-being and anonymity of patients. Evidence of not respecting patient wishes and increases in unethical medical practices has tainted the reputation of the medical profession in society. Deteriorating doctor-patient relationships and a lack of awareness in medical practitioners of ethical principles have led to increases in lawsuits on doctors by their patients. Measures are required to improve awareness of ethics among healthcare providers to achieve healthy doctor-patient relationships. This is the first study to evaluate medical students' knowledge of medical ethics. We used an online platform to distribute the questionnaire, which may affect the result's generalizability, and this might be considered as a limitation of the study.

5. CONCLUSION

In conclusion, medical students at the UQU generally appreciate the significance of knowledge about medical ethics, and the majority showed significant variability to individual questions. About a third of the participants had a fair knowledge level regarding medical ethics and consent. It was also found that students in their preclinical years have a poorer knowledge base when compared to clinical year students; this is related to the ethics curriculum, which is meant to teach over the years. Lectures with clinical training seem to have been the most helpful mode of education for these students. Most had little or no experience using other sources to be informed, such as journals, books, or workshops when dealing with ethical issues. These findings are taken into account while making decisions. They are determining how to teach ethics to health care personnel. More effort should be paid to improving student awareness regarding medical ethics, which will improve their professional practice and the quality of healthcare provided. This can be accomplished by integrating medical ethics into their study courses to learn the value of ethics truly.

Author contribution

Ahmad Hasan Mufti, study conception, supervision, project administration, and revision.

Anwar Maysha Almuqati contributes to the literature review and writing/ manuscript preparation: writing the initial draft, data collection, formal analysis.

Bushra Mubarak Aldajani contributes to the literature review and writing/ manuscript preparation: visualization and data presentation, data collection.

Sarah Nasir Alduayah, contributes to writing/ manuscript preparation: critical review and revision and data collection.

Shahad Omar Bamerdah, literature review and contribute to writing/ manuscript preparation: writing the initial draft, data collection, supervision.

Ethical approval

The Medical Ethics Committee of Umm Al-Qura University, Saudi Arabia, approved the study ethical approval number: (HAPO-02-K-012-2021-09-767). Furthermore, electronic informed consent was obtained from each participant to submit their answers, and they can withdraw at any time.

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Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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